Chapter 3: Study Corridor Segment Details

This chapter describes the environmental and roadway conditions in each of the eight project study segments.

3.1 Segment 1: Project Start (MP 21) to Daniels Summit (MP 34)

3.1.1 Existing Environmental Conditions along Segment 1

The 13-mile-long Segment 1 travels through Daniels Canyon and ends at Daniels Summit. The geology of this segment is a transition area of rock that is defined in part by the Round Valley Fault System. There are some hydric soils in this segment along Daniels Creek, which might indicate the presence of wetlands. There are minor amounts of soils that typically support prime farmland and farmland of statewide importance low in the canyon.

US 40 through Daniels Canyon

Along this segment, there are five US 40 crossings of intermittent streams and 11 crossings of Daniels Creek, a perennial stream. Although no water bodies along this segment are identified as impaired under Section 303(d) of the Clean Water Act, modifications to Daniels Creek and the intermittent streams are likely regulated under Section 404 of the Clean Water Act. There is a FEMA-mapped floodplain for Daniels Creek along this segment.

Vegetation along this segment transitions from sagebrush/grass and mountain brush near the western end to aspen, Douglas fir, lodgepole pine, white fir, and spruce/fir communities as the road travels east to Daniels Summit. Wildlife typical of this segment includes large mammals such as mule deer, elk, moose, and black bear and small mammals such as cottontail rabbit and snowshoe hare. Two species of forest grouse also use this area. Wildlife strikes in this segment appear to be concentrated at the mouth of the canyon and between about MP 30 and the summit at MP 34.

Special-status species that could occur near or along Segment 1 include bald eagle and Canada lynx. Other special-status species, such as whooping cranes, might migrate through the area.

The cultural resource investigation did not identify any previously recorded resources in this segment. There are five recreation areas administered by USFS that could be subject to the provisions of Section 4(f) of the Department of Transportation Act.

There are no records of any closed leaking underground storage tanks (LUSTs) along the highway in Segment 1.

3.1.2 Roadway Conditions along Segment 1

3.1.2.1 Existing Conditions

Segment 1 is characterized by mountainous terrain with an average grade of 4%. Passing is allowed in 93% of the segment, but there are only two formal eastbound passing lanes. According to public comments, additional passing opportunities are needed on this segment of US 40. The average right-of-way width is 133 feet, and the shoulder widths narrow to 2 feet or less along some portions of the segment. The pavement condition is considered good. Recent surface treatments in this segment include new pavement in 2002 between about MP 18 (the study corridor begins at MP 21) and MP 27, new construction in 2001 between about MP 28 and MP 35, and surface seal in 2002 between about MP 28 and MP 35. UDOT recently performed roadway resurfacing between the Clegg Canyon turnoff (about MP 27) and the entrance to Lodgepole Campground (about MP 33) and installed rumble strips from the junction of US 40 and SR 189 (outside the study corridor) to the Clegg Canyon turnoff. Both projects were completed in mid-October 2007.

UDOT has not applied sufficiency ratings to any structures in this segment.

As described in Section 2.4.5.1, Level of Service, the level of service for the study corridor was determined for both highway segments and for intersections with traffic signals. Segment 1 contains only highway segments. The current level of service during both the morning (AM) and evening (PM) peak periods is LOS A. The 2005 annual average daily traffic (AADT) for this segment was 4,135 vehicles.

Table 3.1-1 summarizes the accident history for Segment 1.

Table 3.1-1. Accidents in Segment 1, 2002–2005

	Number of Reported Accidents					
Year	Property Damage Only	Possible or Minor Injuries	Serious Injuries	Fatalities	Total Per Mile[a]	Total Serious or Fatal per Mile
2002	23	7	3	1	2.64	0.31
2003	25	12	4	0	3.18	0.31
2004	36	6	2	0	3.41	0.16
2005	31	7	2	1	3.18	0.23

Source: UDOT 2007

[a] The exact length of Segment 1 is 12.9 miles.

3.1.2.2 Future Conditions

In general, UDOT's goals for capacity are to provide a level of service of at least LOS C on rural highways and LOS D on urban streets. For this project, LOS C is considered to be the acceptable standard for highway segments.

The US 40 corridor study process included projections of future (2035) level of service along the study corridor. These projections assume that no highway improvements would be completed between now and 2035. Detailed information about future level of service calculations is included in Appendix B, Level of Service Methodology. The future level of service on segments of US 40 is summarized and compared to the existing level of service in Table 3.1-2 and Table 3.1-3 below and in Figure 3-1, Existing and Future PM Peak Level of Service.

As shown in Table 3.1-2 and Table 3.1-3, Segment 1 is expected to operate at an acceptable level of service during the PM peak period in 2035 but is not expected to meet the standard of LOS C in 2035 during the AM peak period.

Table 3.1-2. Level of Service on Segments of US 40 in 2007 and 2035 during the AM Peak Period

LOS Segment[a]	Project Segment(s)	LOS	
		2007	2035
1 (MP 21.4 to MP 35.6)	1	A	D
2 (MP 35.6 to MP 43.0)	2	C	C
3 (MP 43.0 to MP 58.3)	2	A	C
4 (MP 58.3 to MP 72.3)	2	A	C
5 (MP 72.3 to MP 85.9)	2	A	C
6 (MP 86.8 to MP 104.6)	4	D	D
7 (MP 105.6 to MP 110.3)	4	B	C
8 (MP 115.2 to MP 116.6)	5	E	E
9 (MP 116.6 to MP 120.3)	5/6	C	D
10 (MP 121.9 to MP 137.6)	6	C	C
11 (MP 137.6 to MP 139.8)	6	C	C
12 (MP 149.9 to MP 157.1)	8	D	C

[a] The segments that were used for the highway level of service analysis are different from the project segments because urban areas were not included and because the analysis considers how terrain affects level of service. Gaps in the segments listed in this table represent urban areas that were not included in the highway segment level of service analysis.

Table 3.1-3. Level of Service on Segments of US 40 in 2007 and 2035 during the PM Peak Period

LOS Segment[a]	Project Segment(s)	LOS	
		2007	2035
1 (MP 21.4 to MP 35.6)	1	A	C
2 (MP 35.6 to MP 43.0)	2	C	C
3 (MP 43.0 to MP 58.3)	2	A	B
4 (MP 58.3 to MP 72.3)	2	A	C
5 (MP 72.3 to MP 85.9)	2	A	B
6 (MP 86.8 to MP 104.6)	4	D	D
7 (MP 105.6 to MP 110.3)	4	C	D
8 (MP 115.2 to MP 116.6)	5	E	E
9 (MP 116.6 to MP 120.3)	5/6	C	D
10 (MP 121.9 to MP 137.6)	6	D	D
11 (MP 137.6 to MP 139.8)	6	D	D
12 (MP 149.9 to MP 157.1)	8	D	D

[a] The segments that were used for the highway level of service analysis are different from the project segments because urban areas were not included and because the analysis considers how terrain affects level of service. Gaps in the segments listed in this table represent urban areas that were not included in the highway segment level of service analysis.

As shown in Table 3.1-4, the AADT of Segment 1 is expected to increase by 76% over 30 years. This is one of the highest-growth areas for daily traffic along the corridor.

Table 3.1-4. Annual Average Daily Traffic Projections for the US 40 Study Corridor

LOS Segment[a]	Project Segment	Annual Average Daily Traffic (number of vehicles)				
		2005[b]	2012	2020	2035	30-Year Change[c]
1	1	4,135	5,249	5,948	7,260	+76% (~2.5%/year)
2	2	4,135	5,249	5,948	7,260	+76% (~2.5%/year)
3	2	2,765	3,367	3,620	4,095	+48% (~1.6%/year)
4	2	3,290	3,855	4,197	4,838	+47% (~1.6%/year)
5	2	3,055	3,711	3,973	4,464	+46% (~1.5%/year)
6	4	5,179	4,981	5,738	7,158	+38% (~1.3%/year)
7	4	6,508	7,140	8,159	10,070	+55% (~1.8%/year)
8	5	6,625	6,976	7,733	9,152	+38% (~1.3%/year)
9	5/6	6,130	6,835	7,535	8,848	+44% (~1.5%/year)
10	6	5,980	5,331	6,227	7,907	+32% (~1.1%/year)
11	6	4,945	5,593	6,467	8,107	+64% (~2.1%/year)
12	8	4,530	5,915	6,564	7,781	+72% (~2.4%/year)

[a] See Table 3.1-2 above, Level of Service on Segments of US 40 in 2007 and 2035 during the AM Peak Period, for a comparison of the LOS segments and project segments.

[b] AADT numbers for 2005 were the most recent available data. AADT information for 2007 was not available when this report was written.

[c] Yearly change is an average based on total change from 2005; it is not adjusted for interim variations in growth.

3.2 Segment 2: Daniels Summit (MP 34) to the Western Duchesne City Limit (MP 86)

3.2.1 Existing Environmental Conditions along Segment 2

Segment 2, which is 52 miles long, travels from Daniels Summit to the western limit of Duchesne. This long segment transitions from mountainous terrain to the Uintah Basin, the landform that dominates the remainder of the segments. Notable geologic features include two fault systems on the western edge of the basin: the Strawberry Fault System on the eastern edge of the Strawberry Valley and the Stinking Springs Fault just east of the Strawberry Fault System. Both faults are north-trending and cross US 40. Information about soils along this segment is unavailable, but it is likely that there are hydric soils associated with wetlands that are connected to the Strawberry River and that are scattered between Strawberry Reservoir and the city of Duchesne (most notably, washes at

MP 50, MP 60, and MP 85). Agricultural production along this segment near Fruitland might indicate the presence of prime farmland or farmland of statewide importance, but soils supporting such farmland are not mapped.

Along this segment, there are 36 crossings by US 40 of intermittent streams (some streams might be crossed more than once), 19 crossings of perennial streams or rivers, and one crossing of Starvation Reservoir (at MP 81). Perennial streams and rivers crossed by US 40 include Strawberry River (MPs 36.5 and 85.7), Co-op Creek (MPs 40 to 41), Chicken Creek (MP 41.8), Trout Creek (MP 44.1), Cow Creek (MP 45), Soldier Creek (MP 50.3), Deep Creek (multiple crossings between MP 52 and MP 58), Currant Creek (MP 58), and Red Creek (MP 65). Both Strawberry Reservoir and Starvation Reservoir are identified as impaired under Section 303(d) of the Clean Water Act, and both have approved total maximum daily load (TMDL) guidelines. FEMA-mapped floodplains along this segment include Strawberry River at MP 36.5, Co-op Creek, Cow Creek, Soldier Creek, Deep Creek from MP 57 to MP 59, and Currant Creek.

Looking westbound from a point just west of the US 40 – Current Creek Road intersection

Vegetation along this segment is typical of the rest of the Uintah Basin. Major vegetation types in the basin include pinyon-juniper woodland, salt desert scrub, desert shrub, agriculture, and disturbed habitats. Ute ladies'-tresses, a special-status plant, occurs throughout the basin in wetland habitats. The basin is dominated by wildlife typical of high, cold deserts, including white-tailed prairie dog, black-tailed jackrabbit, coyote, beaver, red fox, porcupine, spotted skunk, and Townsend's big-eared bat. The dominant desert shrub habitat is used by burrowing owls, short-eared owls, ferruginous hawks, sage sparrows, lark sparrows, western meadowlarks, loggerhead shrikes, horned larks, and occasional irruptions (sudden population increases) of lark buntings. Golden eagles nest throughout the region. Reptiles that inhabit the Uintah Basin include the faded pygmy rattlesnake, striped whipsnake, and Woodhouse's toad. Sandhill cranes and occasionally whooping cranes pass through the basin during migration. The basin is year-round range for deer and pronghorn antelope and is important winter range for elk. Large mammals frequently cross the highway in the Strawberry Valley between about MP 35 and MP 55. Wildlife strike information shows a concentration of strikes around MP 60.

Special-status species that could occur near or along Segment 2 include bald eagle (especially during the winter around Strawberry Reservoir), Canada lynx, Ute ladies'-tresses, and Barneby ridge-cress. Other special-status species, such as whooping cranes, might migrate through the area.

The cultural resource investigation identified a portion of the historic Victory Highway, a resource that is eligible for listing on the National Register of Historic Places (NRHP), in this segment. There is a cemetery on the south side of the highway at about MP 63. There are 11 recreation areas that could be subject to the provisions of Section 4(f), including nine USFS facilities and two state facilities (Currant Creek Wildlife Management Area and Starvation State Park).

There are records of three closed LUSTs along the highway in Segment 2.

3.2.2 Roadway Conditions along Segment 2

3.2.2.1 Existing Conditions

The terrain of Segment 2 is rolling between about MP 35 and MP 43, with the rest considered mountainous with average grades of 3% to 4%. Passing is allowed in 83% of the segment. Even though there are several formal passing lanes (12 total, six in each direction), public comments about this segment of US 40 identified a need for additional passing lanes. The average right-of-way width is 232 feet, and the pavement condition is considered good. Recent surface treatments and minor construction in this segment include surface seal in 2004 between MP 35 and MP 51, surface rejuvenation in 2005 between MP 51 and MP 58, structural overlay in 2002 between MP 59 and MP 68, and surface seal in 2002 between MP 68 and MP 86. In the near future, UDOT is planning roadway reconstruction without widening between MP 54.7 and MP 58.7 (2008) and preventive maintenance of the bridge over Starvation Reservoir at MP 81. UDOT currently rates the sufficiency of the Starvation Reservoir Bridge as good.

In addition to the Starvation Reservoir Bridge, there are four other structures to which UDOT has applied sufficiency ratings in this segment: Strawberry River Bridge at MP 36.9, Currant Creek Bridge at MP 58.1, Red Creek Bridge at MP 65, and Sand Wash Bridge at MP 66.5. The Red Creek Bridge is rated as poor. The Sand Wash Bridge is considered fair, and the remaining three (including Starvation Reservoir Bridge) are considered to be in good condition.

Like Segment 1, Segment 2 contains only highway segments. As shown above in Table 3.1-2, Level of Service on Segments of US 40 in 2007 and 2035 during the AM Peak Period, and Table 3.1-3, Level of Service on Segments of US 40 in 2007 and 2035 during the PM Peak Period, the current level of service is LOS C

in both the AM and PM peak periods from MP 35.6 to MP 43.0. The remainder of the segment operates at LOS A during both the AM and PM peak periods.

The 2005 AADT of this segment varies from a high of 4,135 vehicles between MP 35.6 and MP 43.0 to a low of 2,765 vehicles between MP 43.0 and MP 58.3.

Table 3.2-1 summarizes the accident history for Segment 2.

Table 3.2-1. Accidents in Segment 2, 2002–2005

	Number of Reported Accidents					
Year	Property Damage Only	Possible or Minor Injuries	Serious Injuries	Fatalities	Total per Mile[a]	Total Serious or Fatal per Mile
2002	58	12	8	3	1.57	0.21
2003	67	17	0	3	1.69	0.06
2004	75	21	10	4	2.13	0.27
2005	68	14	10	5	1.88	0.29

Source: UDOT 2007

[a] The exact length of Segment 2 is 51.56 miles.

3.2.2.2 Future Conditions

The future level of service for Segment 2 is summarized and compared to the existing level of service in Table 3.1-2 and Table 3.1-3 above. As shown in the tables, Segment 2 will meet UDOT's standard of LOS C in 2035.

As shown above in Table 3.1-4, Annual Average Daily Traffic Projections for the US 40 Study Corridor, the AADT of Segment 2 is expected to increase by between 46% and 48% between MP 43.0 and MP 85.9. Between MP 35.6 and MP 43.0, the AADT is expected to increase by 76% over 30 years.

3.3 Segment 3: Incorporated Area of Duchesne (MP 86 to MP 88)

3.3.1 Existing Environmental Conditions along Segment 3

Segment 3, which is 2 miles long, passes through the developed area of the city of Duchesne. The segment is dominated by developed and disturbed habitats except on the fringes, where vegetation and wildlife typical of the Uintah Basin are found. This segment could contain the special-status species Ute ladies'-tresses in riparian areas associated with the Strawberry River. A high number of wildlife strikes has been recorded on the western end of this segment between Starvation Reservoir (which the highway crosses in Segment 2 at about MP 81) and downtown.

US 40 entering Duchesne from the west

The results of the cultural resources records search at the Utah Office of State History did not show any previously recorded sites eligible for listing on the NRHP. However, there are a number of historic homes and businesses along US 40 in this segment. The city park and pool complex on US 40 is subject to the provisions of Section 4(f) and might be subject to the provisions of Section 6(f) of the Land and Water Conservation Fund Act.

The highway crosses one stream in this segment: the Strawberry River at about MP 88. FEMA has mapped the floodplain for this perennial stream.

As is typical of more urbanized areas, there are several sites along the highway where LUSTs have been closed (eight total).

3.3.2 Roadway Conditions along Segment 3

3.3.2.1 Existing Conditions

The terrain of Segment 3, which travels through the city of Duchesne, is generally level. Passing is allowed in 83% of the segment, much of it through the portion of the city where there are four travel lanes. The average right-of-way width is 168 feet, and the pavement condition is considered fair. Recent surface treatments in this segment include surface rejuvenation between MP 85.9 and MP 86.8 in 2003 and structural overlay between MP 86.8 and MP 97.2 (in Segment 4), also in 2003.

UDOT has applied sufficiency ratings to two structures in this segment, both over the Strawberry River. Both structures are considered to be in good condition.

Because Segment 3 travels through a more urbanized area, the level of service for this segment was not determined. The current level of service for Segment 2 to the west is LOS A during both the AM and PM peak periods, and the level of service for Segment 4 to the east of Segment 3 is LOS D during both the AM and PM peak periods.

The current AADT of the portion of Segment 2 to the west is 3,055 vehicles, and the AADT of the portion of Segment 4 just to the east is 5,179 vehicles.

Table 3.3-1 summarizes the accident history for Segment 3.

Table 3.3-1. Accidents in Segment 3, 2002–2005

	Number of Reported Accidents					
Year	Property Damage Only	Possible or Minor Injuries	Serious Injuries	Fatalities	Total Per Mile[a]	Total Serious or Fatal per Mile
2002	5	1	2	0	4.79	1.20
2003	3	3	1	0	4.19	0.60
2004	6	8	0	0	8.38	0.00
2005	5	3	0	0	4.79	0.00

Source: UDOT 2007

[a] The exact length of Segment 3 is 1.67 miles.

3.3.2.2 Future Conditions

As noted in Section 3.3.2.1, Existing Conditions, the level of service was not calculated for this segment. The future level of service for Segment 2 to the west of this segment is expected to be acceptable during both the AM peak and PM peak periods. The level of service for Segment 4, which is just east of Duchesne, is projected to remain at its current level of LOS D during both the AM and PM peak periods in 2035.

The AADT of the portion of Segment 3 to the west is expected to increase by 46% over 30 years, while the AADT of the portion of Segment 4 to the east is expected to increase by 38% over the same period.

3.4 Segment 4: Eastern Limit of Duchesne (MP 88) to the Western Limit of Roosevelt (MP 112)

3.4.1 Existing Environmental Conditions along Segment 4

The 24-mile-long Segment 4 travels from the eastern limit of the city of Duchesne to the western limit of Roosevelt. The geology of this segment is typical of the Uintah Basin (older Tertiary rock with intrusions of younger Quaternary rock). The Duchesne–Pleasant Valley Fault System is just south of US 40 along the western end of this segment. This east-west-trending normal fault system does not cross the highway.

Though information about soils along this segment is unavailable, it is likely that there are hydric soils associated with wetlands and dry washes all along the segment, but especially between MP 96 and MP 106. Agricultural production occurs all along this segment and might indicate the presence of prime farmland or farmland of statewide importance, but soils supporting such farmland are not mapped.

This segment crosses three perennial streams, nine intermittent streams, and 18 canals or ditches. Perennial streams include Antelope Creek (MP 97), the Duchesne River (MP 105), and Dry Gulch Creek (MP 110). Antelope Creek, the Duchesne River, and Dry Gulch Creek and its tributaries are listed as impaired under Section 303(d) of the Clean Water Act. There are approved TMDLs for Antelope Creek and the Duchesne River. FEMA has mapped the floodplain of the Duchesne River, which runs parallel to US 40 for most of this segment.

Vegetation and wildlife along this segment are typical of the Uintah Basin, as described in Section 3.2, Segment 2: Daniels Summit (MP 34) to the Western Duchesne City Limit (MP 86). Special-status species that could use the area include southwestern willow flycatcher, yellow-billed cuckoo, Barneby ridge-cress, clay reed-mustard (also known as clay thelopody), Ute ladies'-tresses, and Uinta Basin hookless cactus. Wildlife strikes have been concentrated between about MP 95 and MP 105 due to the proximity of the Duchesne River and other perennial streams.

The results of the cultural resources records search at the Utah Office of State History show a number of NRHP-eligible historic dams and ditches (including the Gray Mountain Canal and Martin Lateral), historic farms and ranches, and historic transportation features, including the Victory Highway. The town of Myton has a number of historic homes, though most are south and east of US 40. Myton Park, the only feature that could be subject to the provisions of

Section 4(f) and Section 6(f), is east of the highway and is not likely to be affected by any improvements to US 40.

There are records of two closed LUSTs along the highway in Segment 4.

3.4.2 Roadway Conditions along Segment 4

3.4.2.1 Existing Conditions

The terrain of Segment 4 is rolling between about MP 87 and MP 105 and mountainous between about MP 106 and MP 111. The mountainous portion of the segment has an average grade of 4.5%. Passing is allowed in 75% of the segment, though there are only two formal passing lanes in the segment (one in each direction) and a widened portion leading into Roosevelt at about MP 111. The average right-of-way width is 137 feet, and the pavement condition is considered good.

Looking south across the intersection of US 40 and SR 87, also known as Ioka Junction

Recent surface treatments and minor construction in this segment include structural overlay in 2003 between about MP 87 and MP 109 and surface rejuvenation between MP 109 and MP 115 (which is in Segment 5). UDOT is currently (September 2007) finishing up a project in the segment that extends the passing lanes east of Myton (about MP 105) and adds acceleration lanes at the Bridgeland intersection (about MP 97). Other future projects listed in the Statewide Transportation Improvement Program include widening from Ioka Junction (about MP 109.6) to west Roosevelt (about MP 111.5) and adding passing lanes between Duchesne and Roosevelt.

UDOT has applied sufficiency ratings to six structures in this segment, including Grey Mountain Canal Bridge at MP 95.6, Antelope Creek Bridge at MP 97.2, Bridgeland-Myton Wash Bridge at MP 100.2, Duchesne River Bridge at MP 105.3, and two bridges over Dry Gulch Canal at MP 106.3 and MP 110.5. The Antelope Creek Bridge was recently replaced and is considered to be in very good condition, as is the Duchesne River Bridge. The Grey Mountain Canal, Bridgeland-Myton Wash, and easternmost Dry Gulch Bridges are all considered to be in good condition. The westernmost Dry Gulch Canal Bridge is considered to be in fair condition.

Segment 4 contains only highway segments. As shown above in Table 3.1-2, Level of Service on Segments of US 40 in 2007 and 2035 during the AM Peak Period, and Table 3.1-3, Level of Service on Segments of US 40 in 2007 and 2035 during the PM Peak Period, the current level of service for the section between MP 86.8 and MP 104.6 is LOS D during both the AM and PM peak periods. Between MP 105.6 and MP 110.3, the level of service is LOS B during the AM peak period and LOS C during the PM peak period.

The current AADT of Segment 4 is 5,179 vehicles between MP 86.8 and MP 104.6 and 6,508 vehicles between MP 105.6 and MP 110.3.

Table 3.4-1 summarizes the accident history for Segment 4.

Table 3.4-1. Accidents in Segment 4, 2002–2005

	Number of Reported Accidents					
Year	Property Damage Only	Possible or Minor Injuries	Serious Injuries	Fatalities	Total Per Mile[a]	Total Serious or Fatal per Mile
2002	51	11	2	0	2.67	0.08
2003	30	16	7	2	2.30	0.38
2004	61	12	1	2	3.17	0.13
2005	44	10	2	0	2.34	0.08

Source: UDOT 2007

[a] The exact length of Segment 4 is 23.95 miles.

3.4.2.2 Future Conditions

As shown in Table 3.1-2 and Table 3.1-3 above, the section of highway between MP 86.8 and MP 104.6 is projected to operate at LOS D during both the AM and PM peak periods in 2035. This is below UDOT's rural standard of LOS C. The section of highway between MP 105.6 and MP 110.3 is projected to operate at an acceptable LOS C during the AM peak period and a deficient LOS D during the PM peak period.

As shown above in Table 3.1-4, Annual Average Daily Traffic Projections for the US 40 Study Corridor, the AADT of Segment 4 is projected to increase by 38% between MP 86.8 and MP 104.6 and by 55% between MP 105.6 and MP 110.3 over the next 30 years.

3.5 Segment 5: Roosevelt and Ballard Incorporated Areas (MP 112 to MP 119)

3.5.1 Existing Environmental Conditions along Segment 5

Segment 5, which is 7 miles long, covers the more urbanized areas of Roosevelt and Ballard. Even though this segment is dominated by developed and disturbed habitats, it still supports four natural streams (one perennial stream—Cottonwood Creek—and three intermittent streams) and four intermittent canals or ditches. There are some hydric soils along Segment 5, as well as some soils that could support prime farmland if irrigated. FEMA has not mapped the floodplain of Cottonwood Creek in this segment.

US 40 through Roosevelt

Vegetation and wildlife types are typical of those found in developed areas and disturbed habitats, though lands along the highway also support a valuable wooded riparian habitat along Cottonwood Creek, a number of prairie dog towns, and raptor nesting habitat. The prairie dog towns might also support black-footed ferrets and burrowing owls. Special-status species that could occur near or along this segment include the Colorado pikeminnow, razorback sucker, clay reed-mustard, shrubby reed-mustard, Ute ladies'-tresses, and Uinta Basin hookless cactus.

There are a number of historic ditches, canals, and waterworks that are eligible for listing on the NRHP in Segment 5, including the State Land Lateral Canal and the Pickup Wash Lateral. This segment of US 40 also passes historic homes and businesses along Roosevelt's historic downtown. Roosevelt Regional Park and Ballard Park are subject to the provisions of Section 4(f). Roosevelt Regional Park might also be subject to the provisions of Section 6(f).

There are two registered hazardous waste handlers along this segment at about MP 114 and MP 117. At least 10 closed LUST sites are also present along the highway in Segment 5.

3.5.2 Roadway Conditions along Segment 5

3.5.2.1 Existing Conditions

The terrain of Segment 5, which is inside the incorporated areas of Roosevelt and Ballard, is rolling and level. Passing is allowed in 86% of the segment, and much of this passing is accommodated by four travel lanes through part of the cities. The average right-of-way width is 97 feet, which is the narrowest average right-of-way along the entire study corridor. The pavement condition is fair due in large part to stop-and-go movements of heavy trucks. Recent surface treatments and minor construction in this segment include surface rejuvenation in 2004 between MP 109.5 in Segment 4 and MP 115.2, structural overlay in 2005 between MP 115.2 and MP 121.7 in Segment 6, and roadway reconstruction with widening (addition of a center turn lane) in 2007 between MP 115.4 and MP 116.4.

UDOT has applied a sufficiency rating to one structure in this segment, a bridge over Cottonwood Creek Bridge at MP 114.6. The Cottonwood Creek Bridge is considered to be in fair condition.

Because Segment 5 is more developed and contains a number of controlled intersections, the level of service was calculated for signalized intersections only. The current level of service was calculated for four intersections: US 40 and State Street, US 40 and Lagoon Street, US 40 and 200 East, and US 40 and 600 East. The existing (2005) AM and PM peak levels of service for these intersections are shown in Table 2.4-10, Level of Service and Delay at Intersections on US 40 in Roosevelt in 2007 during the AM Peak Period, and Table 2.4-11, Level of Service and Delay at Intersections on US 40 in Roosevelt in 2007 during the PM Peak Period, in Chapter 2, General Description of the Study Corridor. As shown in these tables, all four intersections operate at LOS A or B during the AM peak period and LOS A, B, or C during the PM peak period.

Average peak-hour traffic volumes at the Roosevelt intersections are shown in Appendix C, Projected Intersection Volumes and Level of Service. The current AADT between MP 115.2 and MP 116.6 (a section that was evaluated separately from the intersections) is 6,625 vehicles.

Table 3.5-1 below summarizes the accident history for Segment 5.

Table 3.5-1. Accidents in Segment 5, 2002–2005

	Number of Reported Accidents					
Year	Property Damage Only	Possible or Minor Injuries	Serious Injuries	Fatalities	Total Per Mile[a]	Total Serious or Fatal per Mile
2002	13	13	4	1	4.42	0.71
2003	19	12	1	0	4.56	0.14
2004	20	11	3	0	4.84	0.43
2005	22	12	5	0	5.56	0.71

Source: UDOT 2007

[a] The exact length of Segment 5 is 7.02 miles.

3.5.2.2 Future Conditions

As explained in Section 2.4.5.1, Level of Service, the *Highway Capacity Manual* (TRB 2000) defines standards for qualitatively assessing traffic flow on roads and highways (that is, determining whether traffic can be described as free flow, forced flow, or something in between). In addition, the *Highway Capacity Manual* defines level of service standards for intersections according to the average overall wait time for a vehicle to pass through an intersection. Level of service can be quantitatively measured at any intersection, and this provides an additional performance measurement for the corridor. Table 3.5-2 lists the intersection level of service indicators in the *Highway Capacity Manual*. UDOT's goal for capacity in urban areas is to provide a level of service at intersections of at least LOS D.

Table 3.5-2. Indicators of Level of Service at Intersections

LOS	Intersection Delay (seconds)
A	0 to 10
B	10 to 20
C	20 to 35
D	35 to 55
E	55 to 80
F	> 80

Source: TRB 2000

The US 40 corridor study process included projections of future (2035) level of service for the four Roosevelt intersections. These projections assume that no highway or intersection improvements are completed between now and 2035. As shown in Table 3.5-3 and Table 3.5-4, all of the intersections are expected to operate at acceptable levels of service in 2035 during both the AM and PM peak periods. Detailed information about level of service and projected delay in 2035 is included in Appendix C, Projected Intersection Volumes and Level of Service.

Table 3.5-3. Level of Service at Intersections on US 40 in Roosevelt in 2007 and 2035 during the AM Peak Period

	Level of Service	
Intersection	2007	2035
US 40/State Street	A	B
US 40/Lagoon Street	B	C
US 40/200 East	B	C
US 40/600 East	A	A

Table 3.5-4. Level of Service at Intersections on US 40 in Roosevelt in 2007 and 2035 during the PM Peak Period

	Level of Service	
Intersection	2007	2035
US 40/State Street	A	C
US 40/Lagoon Street	B	E
US 40/200 East	C	D
US 40/600 East	A	C

As shown above in Table 3.1-4, Annual Average Daily Traffic Projections for the US 40 Study Corridor, the AADT between MP 115.2 and MP 116.6 is expected to increase by 38% over the next 30 years. Peak-period intersection volumes in Roosevelt are expected to increase by 3.34% per year. Projected future intersection volumes are listed in Appendix C, Projected Intersection Volumes and Level of Service.

3.6 Segment 6: Eastern Limit of Ballard (MP 119) to the Western Limit of Vernal (MP 142)

3.6.1 Existing Environmental Conditions along Segment 6

The 23-mile-long Segment 6 extends from the eastern edge of the more urbanized areas associated with Roosevelt and Ballard to the western limit of Vernal. There are limited soils that could support prime farmland along this segment, which is reflected in a general lack of agricultural production compared to that in Segment 4. Some hydric soils occur along the Uinta River around MP 121 and along a number of washes in this segment that could support wetlands. US 40 crosses two perennial streams (Montes Creek at MP 119 and Uinta River at MP 122), 18 intermittent streams or washes (which represent the crossing of a single feature more than once), and seven canals or ditches. The Uinta River, which is listed as impaired under Section 303(d) of the Clean Water Act, has an approved TMDL. FEMA has mapped floodplains for Montes Creek, the Uinta River, Sand Wash (MP 130), Halfway Hollow Creek (MP 131), and Twelvemile Wash (MP 134 through MP 138).

Looking west at the uphill grade from the intersection of US 40 and SR 88

The geology, vegetation, and wildlife along this segment are typical of the Uintah Basin. Special-status species that could use the area include the Colorado pikeminnow, razorback sucker, clay reed-mustard, Ute ladies'-tresses, shrubby reed-mustard, and Uinta Basin hookless cactus. Wooded riparian habitat occurs near the Uinta River in Fort Duchesne, and there are prairie dog towns between about MP 125 and MP 135.

There are some ditches and canals along this segment that are identified as NRHP-eligible. Other cultural resources of note are the Wing Song Store near Fort Duchesne and a cemetery, also near Fort Duchesne. There are no park and recreation resources that would be subject to the provisions of Section 4(f) or Section 6(f).

There are two closed LUST sites in this segment, both near Fort Duchesne.

3.6.2 Roadway Conditions along Segment 6

3.6.2.1 Existing Conditions

The terrain of Segment 6 is mountainous between MP 117 in Segment 5 and MP 120.3 (average grade of 3%) and between MP 137.6 and MP 139.8 (average grade of 4%). The remainder of the segment—MP 121.9 to MP 137.6—is rolling. Passing is allowed in 79% of the segment, though there are only two formal passing lanes in the segment (one in each direction). The general public and local stakeholders have noted that additional passing lanes and acceleration and deceleration lanes are needed in this segment due to heavy truck traffic. The average right-of-way width is 256 feet, which is the widest of all segments along the corridor, and the pavement condition is good.

Recent surface treatments (structural overlay) were completed in 2005 between about MP 115.2 in Segment 5 and MP 141.5. In 2007, UDOT extended the eastbound passing lane from the "Twists" (about MP 134) to the Vernal city limit at about MP 141.5. Future planned projects for Segment 6 include installing a signal at the intersection of 7500 East (about MP 121.5) in Fort Duchesne (2008), adding passing lanes from MP 139 to MP 141 (no date identified), and improving the intersection of US 40 and SR 88 at MP 130.5 (no date identified).

UDOT has applied sufficiency ratings to five structures in this segment, including the Uinta River Bridge at MP 121.6, Sand Wash Bridge at MP 129.5, Halfway Hollow Wash Bridge at MP 130.9, and Twelvemile Wash Bridge at MP 133.7. The Uinta River, Halfway Hollow, and Twelvemile Wash Bridges are in good condition. The Sand Wash Bridge is in very good condition.

Segment 6 contains only highway segments. As shown above in Table 3.1-2, Level of Service on Segments of US 40 in 2007 and 2035 during the AM Peak Period, this segment currently operates at LOS C during the AM peak period. During the PM peak period, the level of service falls to LOS D between MP 121.9 and MP 139.8 (see Table 3.1-3 above, Level of Service on Segments of US 40 in 2007 and 2035 during the PM Peak Period).

As shown above in Table 3.1-4, Annual Average Daily Traffic Projections for the US 40 Study Corridor, the 2005 AADT of Segment 6 was 6,130 vehicles between MP 116.6 (in Segment 5) and MP 120.3, 5,980 vehicles between MP 121.9 and MP 137.6, and 4,945 vehicles between MP 137.6 and MP 139.8.

Table 3.6-1 below summarizes the accident history for Segment 6.

Table 3.6-1. Accidents in Segment 6, 2002–2005

Year	Number of Reported Accidents					
	Property Damage Only	Possible or Minor Injuries	Serious Injuries	Fatalities	Total Per Mile[a]	Total Serious or Fatal per Mile
2002	20	9	6	0	1.52	0.26
2003	23	9	5	2	1.70	0.30
2004	26	6	10	0	1.83	0.44
2005	42	15	3	1	2.65	0.17

Source: UDOT 2007

[a] The exact length of Segment 6 is 22.98 miles.

3.6.2.2 Future Conditions

As shown above in Table 3.1-2 and Table 3.1-3, the sections between MP 116.6 and MP 120.3 and between MP 137.6 and MP 139.8 are projected to operate at LOS D during both the AM and PM peak periods in 2035, which does not meet UDOT's standard. The section between MP 121.9 and MP 137.6 is projected to operate at LOS C during the AM peak period and LOS D during the PM peak period in 2035. This section of the segment meets UDOT's rural standard during the AM peak period only.

As shown above in Table 3.1-4, the AADT of Segment 6 is expected to increase by 44% between MP 116.6 (in Segment 5) and MP 120.3, by 32% between MP 121.9 and MP 137.6, and by 64% between MP 137.6 and MP 139.8 over the next 30 years.

3.7 Segment 7: Vernal and Naples Incorporated Areas (MP 142 to MP 149)

3.7.1 Existing Environmental Conditions along Segment 7

Segment 7, which is 7 miles long, travels through the developed areas of Vernal and Naples. This segment contains some hydric soils, and there are wetland complexes between MP 145 and MP 155 (which is in Segment 8). Some soils along this segment could support prime farmland if irrigated. Agricultural production is common in the Vernal/Naples area, though there are few areas in production close to US 40 along this segment.

Looking northeast from the intersection of US 40 and 2500 West in west Vernal

Segment 7 crosses three intermittent streams and three canals or ditches. There are no impaired water bodies along this segment. FEMA has mapped floodplains for three canals: Steinaker Service Canal (MP 143), Ashley Central Canal (MP 143), and Ashley Canal (MP 147).

Vegetation and wildlife types are typical of those found in developed areas and disturbed habitats. Wildlife strikes have been minimal along this segment. Special-status species that could use canals in the area include bonytail, Colorado pikeminnow, Ute ladies'-tresses, and razorback sucker.

The cultural resources records search did not show any previously recorded NRHP-eligible resources along the highway in this segment. However, there are many historic homes and businesses along the highway in Vernal and Naples. Cobble Rock Park and Kiwanis Park, both at about MP 144 but on opposite sides of the highway, would be subject to the provisions of Section 4(f) if they would be affected by future road improvement projects. Cobble Rock Park might also be subject to the provisions of Section 6(f).

There is one registered hazardous waste handler along this segment at about MP 145. At least 22 closed LUST sites are also present along the highway in Segment 7.

3.7.2 Roadway Conditions along Segment 7

3.7.2.1 Existing Conditions

The terrain of Segment 7, which is inside the incorporated areas of Vernal and Naples, is rolling and level. Passing is allowed in 82% of the segment, much of it accommodated by four travel lanes through part of the cities. The average right-of-way width is 113 feet, and the pavement condition is fair due in large part to stop-and-go movements of heavy trucks. Recent surface treatments and minor construction in this segment include surface seal in 2003 between MP 141.5 and MP 145.9 and structural overlay in 2005 between MP 145.9 and MP 156.6 (in Segment 8). The Statewide Transportation Improvement Program also lists highway beautification in Vernal as an upcoming project.

Intersection of US 40 and SR 45 in Naples

UDOT has applied a sufficiency rating to one structure in this segment: the Steinaker Canal Bridge. This structure is considered to be in good condition.

Because Segment 7 is more developed and contains a number of controlled intersections, the level of service was calculated for signalized intersections only. The current level of service was calculated for five intersections: US 40 and 100 South, US 40 and 500 West, US 40 and 100 West, US 40 and Vernal Avenue (US 191), and US 40 and 500 East. The existing (2005) AM and PM peak levels of service for these intersections are shown in Table 2.4-12, Level of Service and Delay at Intersections on US 40 in Vernal in 2007 during the AM Peak Period, and Table 2.4-13, Level of Service and Delay at Intersections on US 40 in Vernal in 2007 during the PM Peak Period, in Chapter 2, General Description of the Study Corridor. As shown in Table 2.4-12, all five modeled intersections currently operate at LOS A, B, or C during the AM peak period. Table 2.4-13 shows that the level of service varies from LOS A (US 40/100 West) to LOS E (US 40/SR 191) during the PM peak period.

Average peak-period traffic volumes at the Vernal intersections are listed in Appendix C, Projected Intersection Volumes and Level of Service. Table 3.7-1 below summarizes the accident history of Segment 7.

Table 3.7-1. Accidents in Segment 7, 2002–2005

Year	Number of Reported Accidents					
	Property Damage Only	Possible or Minor Injuries	Serious Injuries	Fatalities	Total Per Mile[a]	Total Serious or Fatal per Mile
2002	79	25	12	3	16.86	2.12
2003	71	21	7	0	14.02	0.99
2004	73	24	7	1	14.87	1.13
2005	85	30	3	0	16.71	0.42

Source: UDOT 2007

[a] The exact length of Segment 7 is 7.06 miles.

3.7.2.2 Future Conditions

Projections for future (2035) operation of the five Vernal intersections are shown in Table 3.7-2 and Table 3.7-3 below. During the AM peak period, the intersection of US 40 and 100 South is expected to operate at LOS F by 2035 while the other intersections are expected to operate at acceptable levels. During the PM peak period, all modeled intersections except one (US 40/100 West) are expected to fail by 2035. The intersection of US 40 and 100 West is expected to operate at an acceptable LOS C during the PM peak period in 2035. Detailed information about level of service and projected delay in 2035 is included in Appendix C, Projected Intersection Volumes and Level of Service.

Table 3.7-2. Level of Service at Intersections on US 40 in Vernal in 2007 and 2035 during the AM Peak Period

Intersection	Level of Service	
	2007	2035
100 South	C	F
500 West	A	B
100 West	A	A
Vernal Avenue/US 191	B	B
500 East	A	B

Table 3.7-3. Level of Service at Intersections on US 40 in Vernal in 2007 and 2035 during the PM Peak Period

Intersection	Level of Service	
	2007	2035
100 South	D	F
500 West	C	F
100 West	A	C
Vernal Avenue/US 191	E	F
500 East	B	F

Peak-period intersection volumes in Vernal are expected to increase by about 1.39% per year. Projected future intersection volumes are detailed in Appendix C, Projected Intersection Volumes and Level of Service.

3.8 Segment 8: Eastern Limit of Naples (MP 149) to Project End (MP 157)

3.8.1 Existing Environmental Conditions along Segment 8

The 8-mile-long Segment 8, which is the easternmost segment along the study corridor, transitions from the more urbanized areas of Vernal and Naples to a landscape more typical of the Uintah Basin. The area supports some agricultural production, especially around the eastern terminus of the project near Naples and the Green River. Hydric soils and soils that would be considered prime farmland if irrigated are common along this segment.

Looking westbound on US 40 between Naples and Jensen at about 6800 East

The vegetation and wildlife along Segment 8 are typical of the Uintah Basin, though there is more agricultural land along this segment than along any other. Agriculture is made possible by water available from the Green River and from Ashley Creek, which US 40 crosses at about MP 154. In addition to crossing Ashley Creek (a perennial stream), Segment 8 crosses six intermittent streams and three canals or ditches. The Green River is just east of the project terminus.

Ashley Creek and some of its tributaries are listed as impaired under Section 303(d) of the Clean Water Act, and a TMDL is pending. FEMA has mapped floodplains for Ashley Creek and its tributaries at about MP 149, MP 151, and MP 154.

Special-status species that could occur in the area include bonytail, Colorado pikeminnow, razorback sucker, clay reed-mustard, shrubby reed-mustard, Ute ladies'-tresses, and Uinta Basin hookless cactus. Records show a moderate occurrence of wildlife strikes between about MP 150 and MP 155.

The cultural resources records search did not show any previously recorded NRHP-eligible resources, and there are no parks that would be subject to the provisions of Section 4(f) or Section 6(f) in this segment.

There are two closed LUST sites near the intersection of US 40 and SR 149, which is the project terminus.

3.8.2 Roadway Conditions along Segment 8

3.8.2.1 Existing Conditions

The terrain of Segment 8 is rolling. Passing is allowed in 90% of the segment, though there are no formal passing lanes. The average right-of-way width is 108 feet, and the pavement condition is good. Recent surface treatments include structural overlay in 2005 between MP 145.9 (in Segment 7) and MP 156.6 and surface seal in 2005 between MP 156.6 and MP 158.6.

UDOT has applied a sufficiency rating to one structure in this segment, the Ashley Creek Bridge at MP 153.7. The bridge is in very good condition.

Segment 8 contains only highway segments. The current level of service for this segment is LOS D during both the AM and PM peak periods (see Table 3.1-2, Level of Service on Segments of US 40 in 2007 and 2035 during the AM Peak Period, and Table 3.1-3, Level of Service on Segments of US 40 in 2007 and 2035 during the PM Peak Period, above). The current AADT of Segment 8 is 4,530 vehicles.

Table 3.8-1 summarizes the accident history for Segment 8.

Table 3.8-1. Accidents in Segment 8, 2002–2005

	Number of Reported Accidents					
Year	Property Damage Only	Possible or Minor Injuries	Serious Injuries	Fatalities	Total Per Mile[a]	Total Serious or Fatal per Mile
2002	10	5	0	0	1.77	0.00
2003	15	2	3	0	2.36	0.35
2004	24	4	3	0	3.66	0.35
2005	20	4	0	0	2.84	0.00

Source: UDOT 2007

[a] The exact length of Segment 8 is 8.46 miles.

3.8.2.2 Future Conditions

As shown in Table 3.1-2 above, this segment is projected to operate at an acceptable LOS C during the AM peak period in 2035. During the PM peak period, the projected 2035 level of service falls to an unacceptable level of LOS D (see Table 3.1-3 above).

As shown above in Table 3.1-4, Annual Average Daily Traffic Projections for the US 40 Study Corridor, the AADT is projected in increase by 72% between now and 2035.

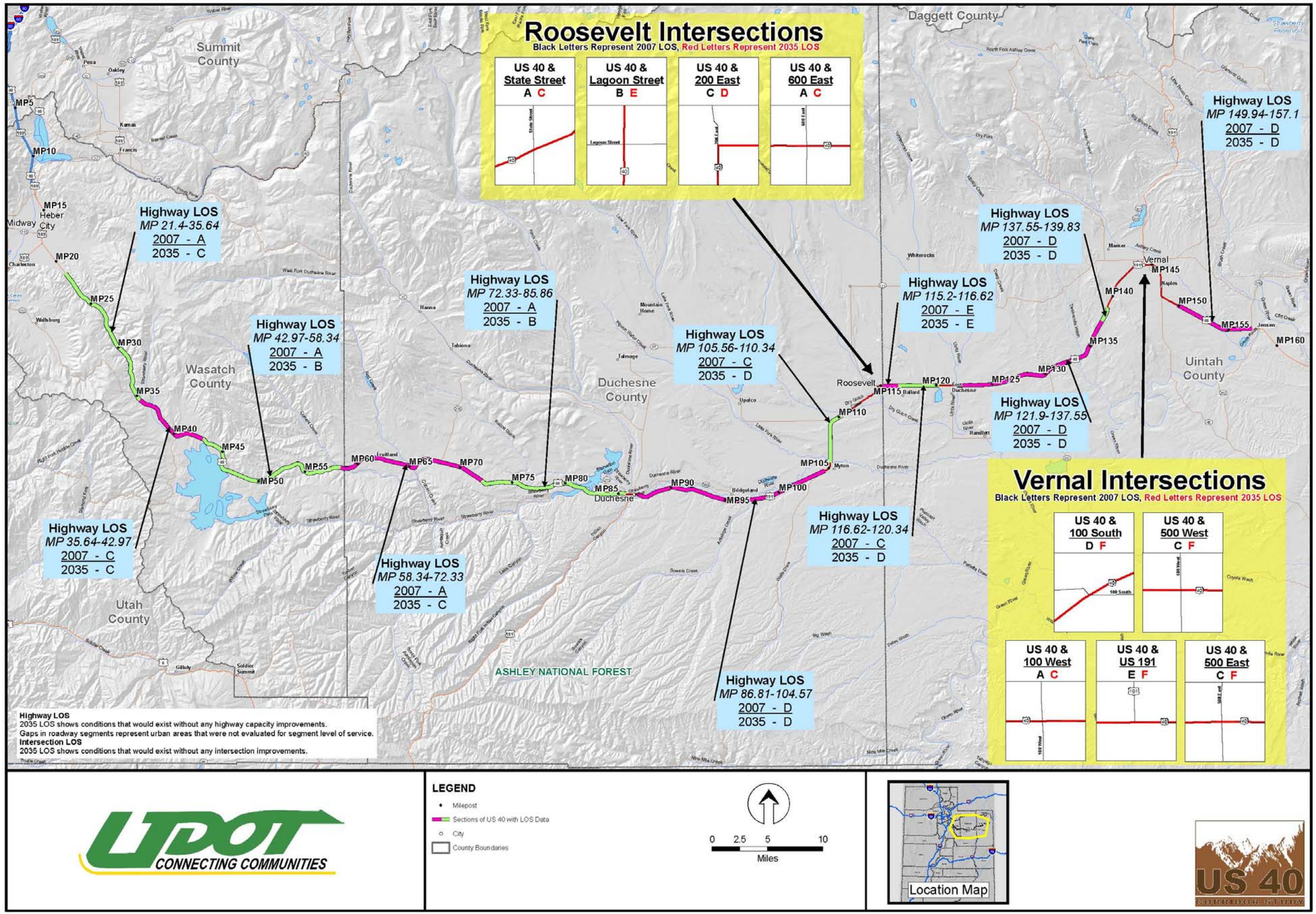

Figure 3-1. Existing and Future PM Peak Level of Service

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